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Overview of SEFSC's Marine Mammal & Sea Turtle Science Programs

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**Review of NOAA Marine Mammal and Sea Turtle Science
Southeast Fisheries Science Center
25-27 August 2015
Miami, FL**



**First they were
hunted with harpoons.**

**Now they're hunted
with cameras.**



SEFSC Protected Species Vision

Provide the **science** needed to support effective **management** for conservation and recovery of protected species populations and restore their role in healthy marine ecosystems.

- **Conservation** is the effort to understand and promote the capacity for self-renewal.
- The **science role** is to understand the conditions necessary for self-renewal.
- The **management role** is to use science to create conditions that promote self-renewal.
- Ecosystem **health** is defined as the ability for self-renewal.

Outline

- Legislative Mandates
- Geography

- Organization
- Partnerships

- Accomplishments
- Challenges
- Opportunities





Endangered Species Act (ESA) 1973

- Assess magnitude of threats to species continued existence (includes sea turtle species).
- Develop and conduct field programs for assessment of US marine mammal populations



Marine Mammal Protection Act (MMPA) 1972 (Amended 1994)

- Develop and implement conservation programs to reduce interactions and mortality of marine mammals

Marine Turtle Conservation Act (MTCA) 2004

- Assist other countries with the conservation of marine turtles and nesting habitat





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1996 Magnuson-Stevens Fishery Conservation Act

Added important measures for conserving protected species

Essential Fish Habitat Protection



Habitat damage, alteration & loss

Bycatch Monitoring and Reduction



Protected species mortality & serious injury
Sub-lethal injury

NOAA Fisheries Service (NMFS) Organization in Southeastern U.S.

Management activities:

Southeast Regional Office (SERO)

- Develop policy and regulations,
- Conduct consultations, enforcement, public outreach, and agreements



St. Petersburg, FL



Headquarters in Miami, FL

Science activities:

Southeast Fisheries Science Center (SEFSC)

- Conduct science research, resource surveys, analysis, and reviews
- Provide scientific information for management

Southeastern US Geography

Three large marine ecosystems, high seas, and many habitats

6 sea turtle species

- Kemp's Ridley (endemic, endangered)
- Green
- Loggerhead
- Leatherback (endangered)
- Hawksbill (endangered)
- Olive Ridley

26 cetacean species (90 stocks)

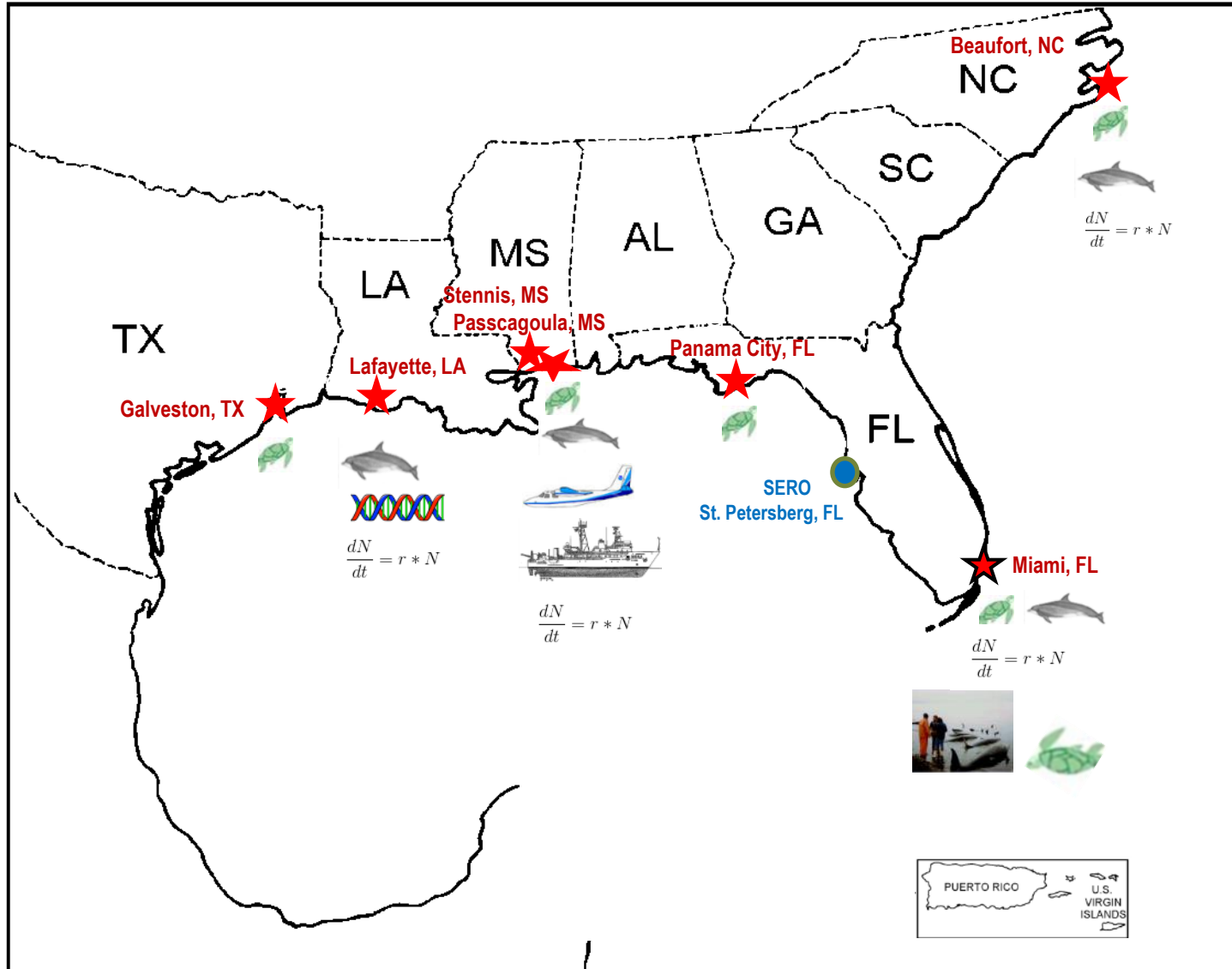
- ~850 annual cetacean strandings
- North Atlantic Right Whale
- GOMx Bryde's Whale

Regional factors

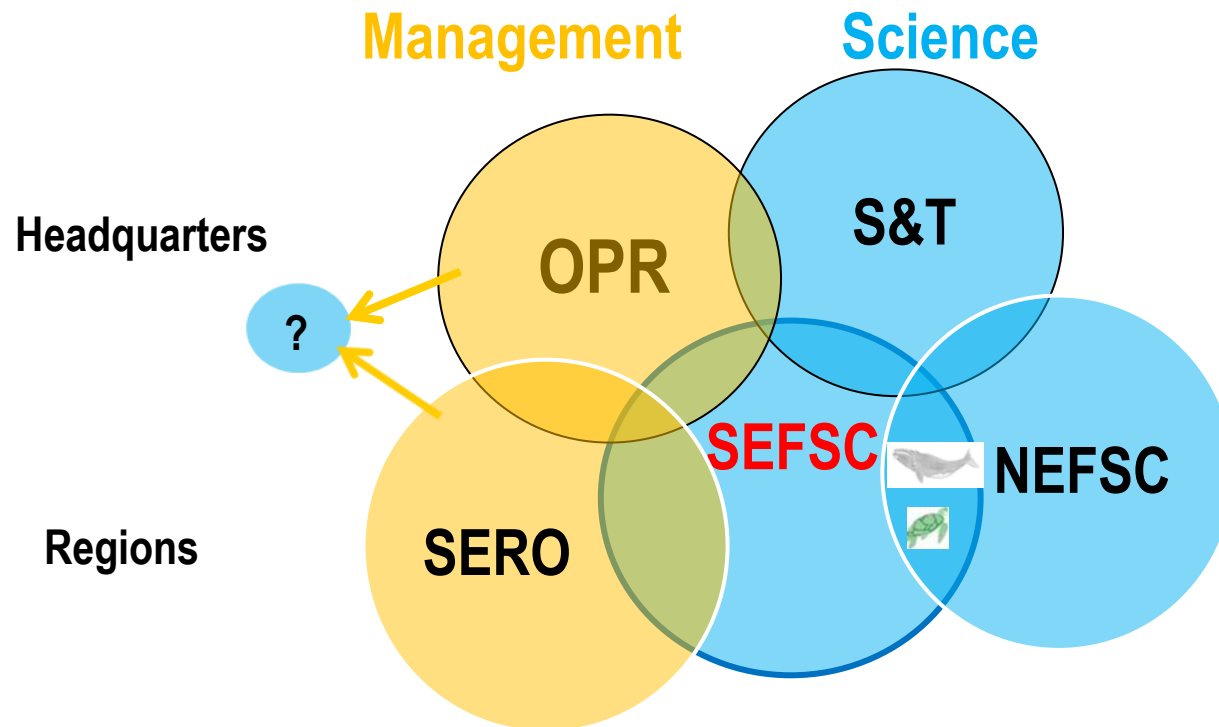
- 33 Caribbean governments
- About half US recreational fishing
- GOMx has 10 of the top 13 busiest US ports by volume.
- SEUS has 20 of top 50 U.S. ports.



Southeast Fisheries Science Center

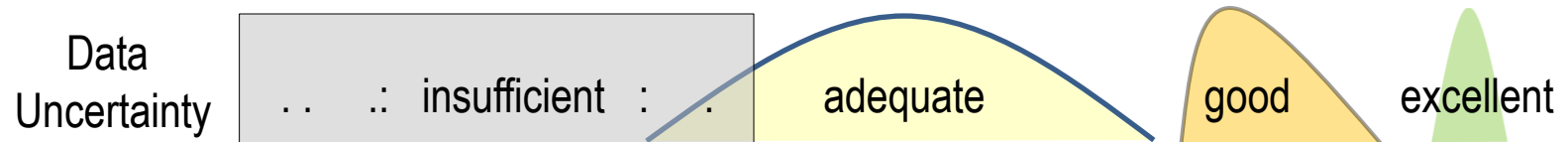


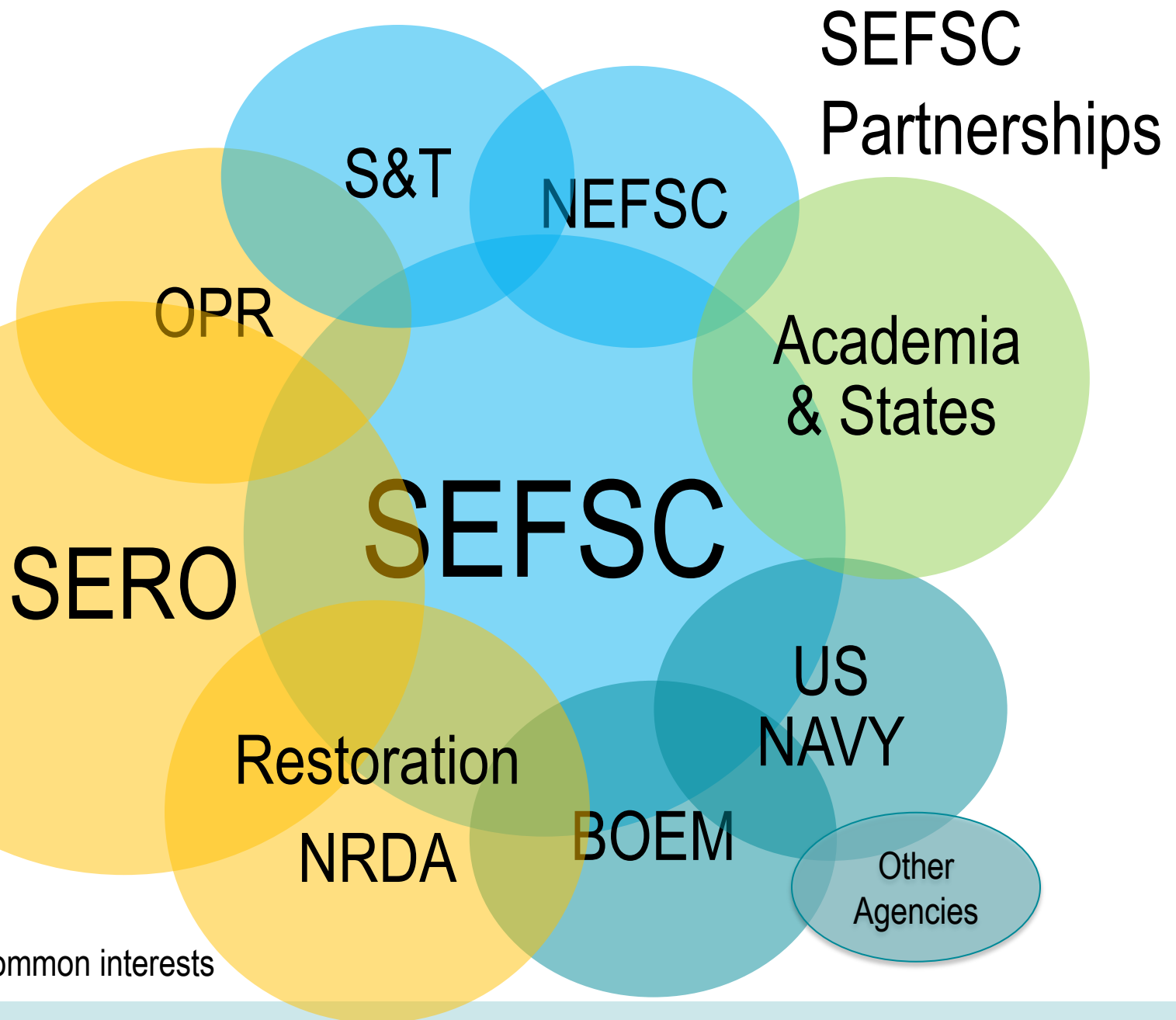
NMFS Protected Species Overlapping Science and Management Relationships



Comparison of Management and Science

	Management	Science
GOAL	Protect and recover protected species populations	
Primary driver	Make and implement strategic decisions and interventions	Conduct strategic research to provide correct answers
Time horizon	Short-term urgency and expediency	Long-term accuracy and precision
Focused on	What is known	What isn't known
Risks	Unknown effectiveness & litigation risk	Time & expense
Bias	<u>Confirmation bias</u> Status quo bias	
Data required	"Best available"	Sufficient (adequate, good, or excellent)





Overlapping common interests

Partnerships

Management
bodies:



SAFMC



GMFMC



CFMC



ICCAT



HMS



GMFMC



ASMFC

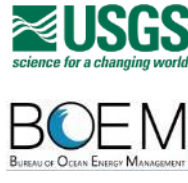
Agencies:



DOI



FWS



BOEM



USGS



MMC



USCG



NAVY



EPA



NMSP

NOS



AOML

Academia:



FLORIDA STATE UNIVERSITY



States



TX



LA



MS



AL



FL



GA



SC



NC



USVI



PR



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Staff & Budgets

Population Biology Research Staff

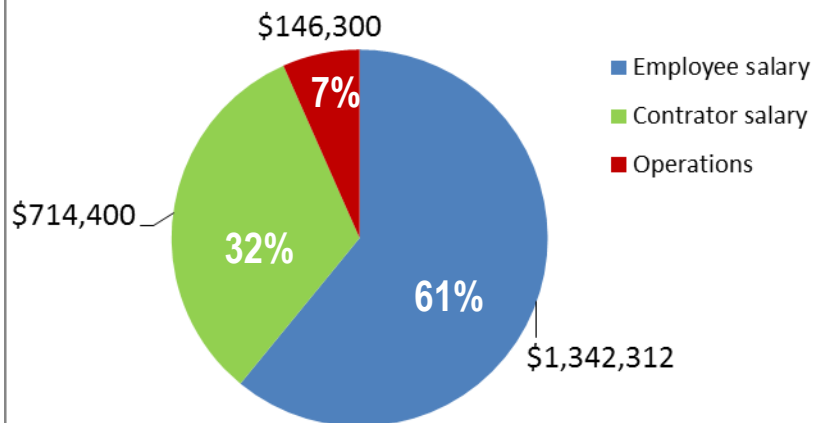
Mammals : ~14 employees, 13 contractors

Sea Turtles : ~9 employees, 2 contractors

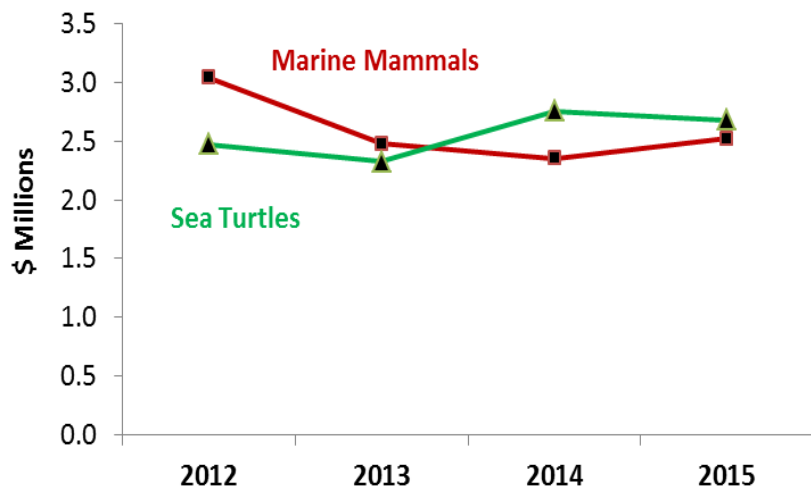
Sea Turtle Bycatch Reduction and Gear Research

~11 part time employees, 6 contractors

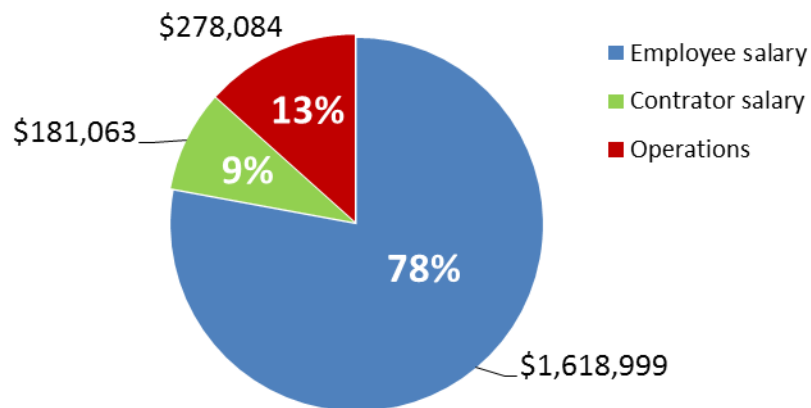
2014 Mammal Base funds (\$2,203,934)



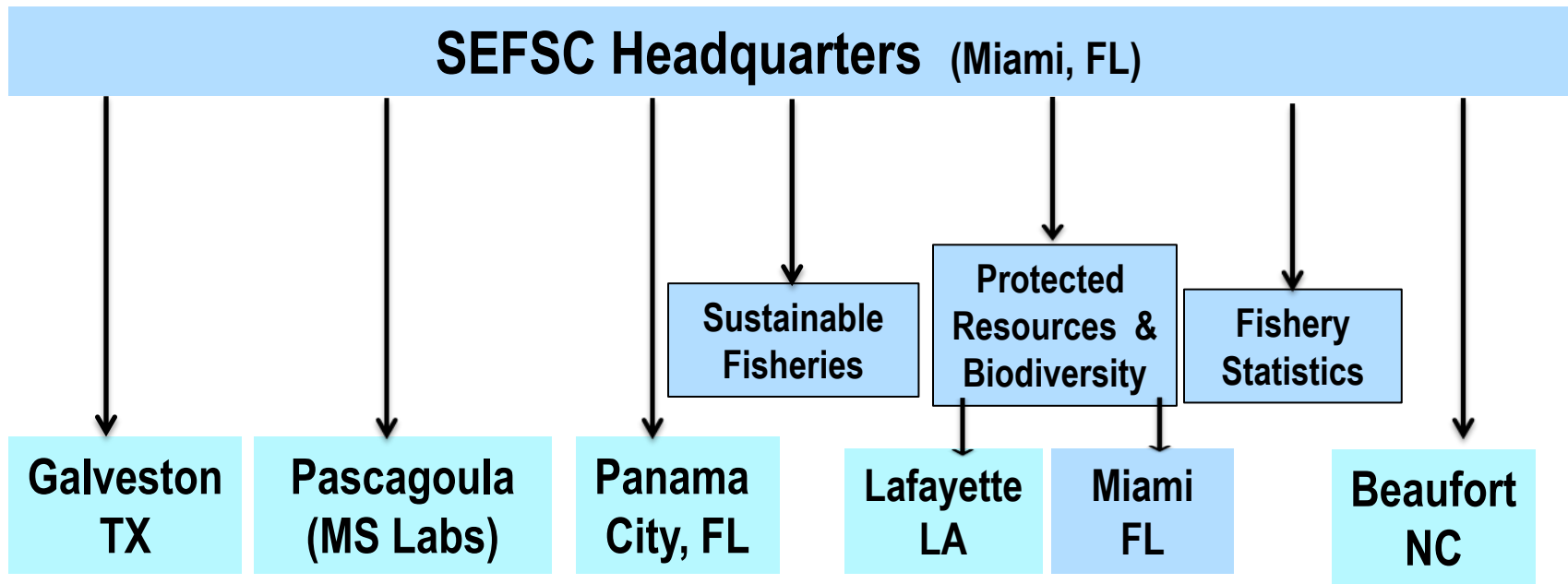
Base Protected Species Annual Funding



2014 Sea Turtle Base funds (\$2,078,146)



Organization – Linear Administrative Structure

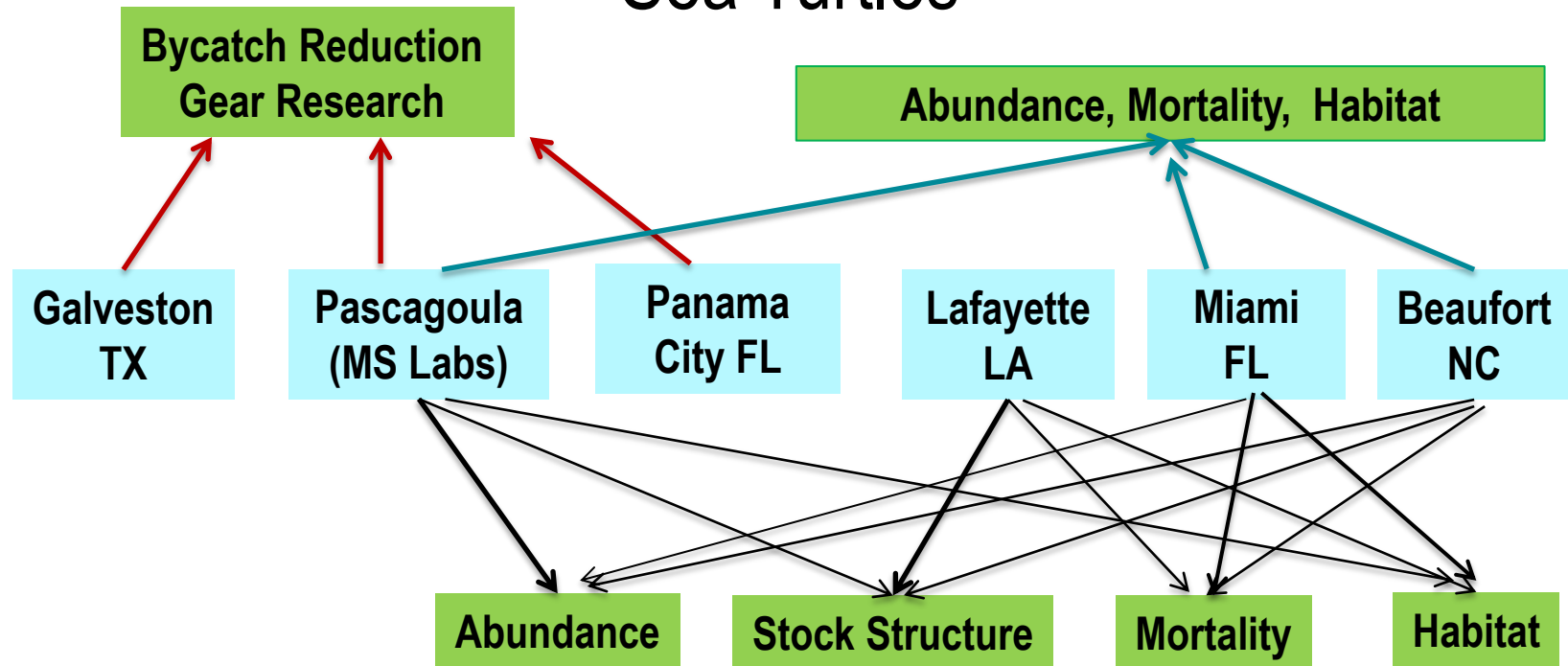


Good science administration has two roles: facilitate completing the mission and safety

Integrated Research Program Structure

SEFSC Headquarters (Miami, FL)

Sea Turtles



Marine Mammals

Protected Resources and Biodiversity Division

James A. Bohnsack, Director

Total 26 Employees + ~ 35 Contractors
(no Branch Chiefs)

Protected Resources Investigations (14 employees)

Sea Turtle Investigation Unit (5)

*Population Assessment
Stranding Coordination*

Marine Mammal Investigation Unit

*Population Assessment
Stranding Coordination*

Miami, FL (7)

Lafayette, LA (2)

Biodiversity Investigations (12)

Biodiversity Unit (2)

South Florida Ecosystems Unit (2)

Early Life History Unit (3)

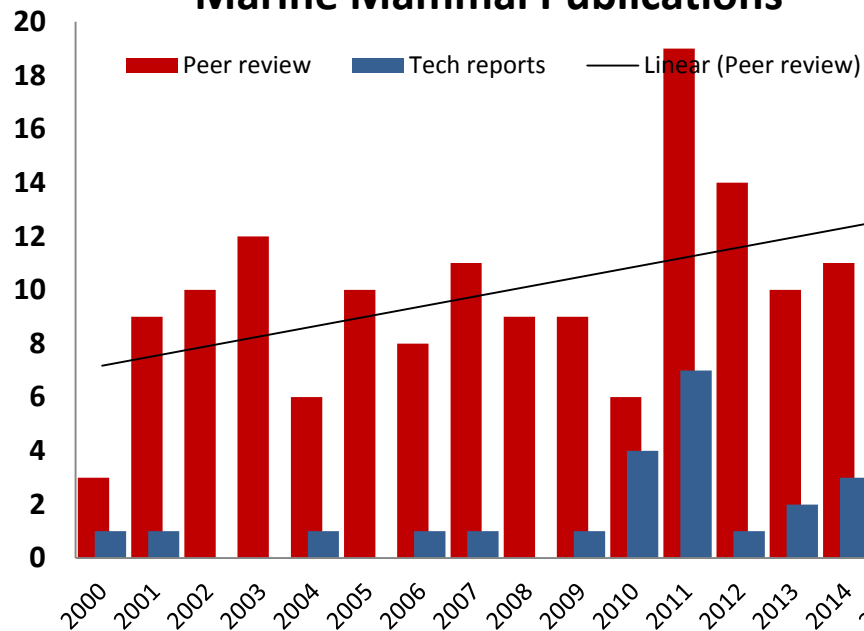
Fish Ecology Unit (4)

Benthic Ecology & Restoration (1)

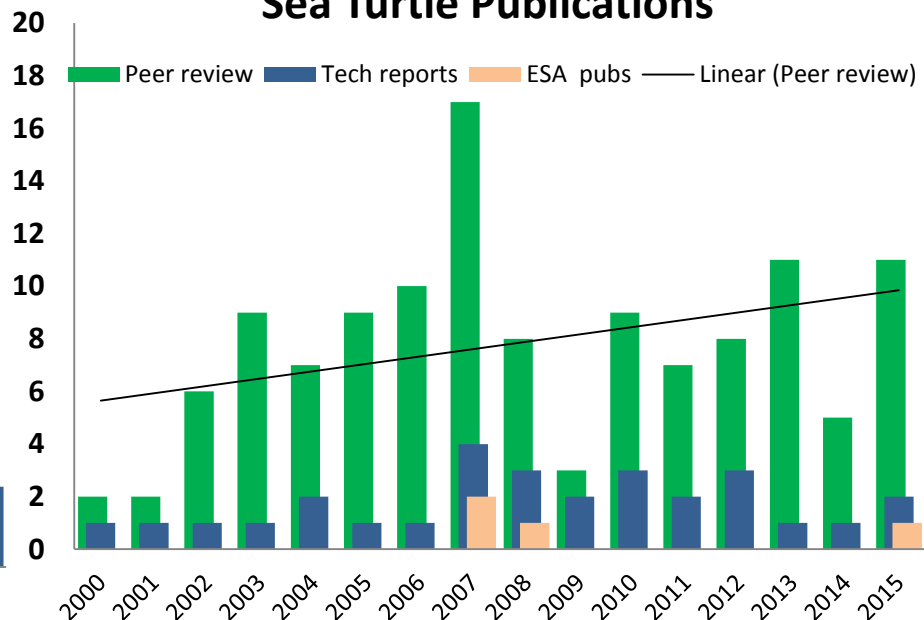
(Corals)

Accomplishments - Publications

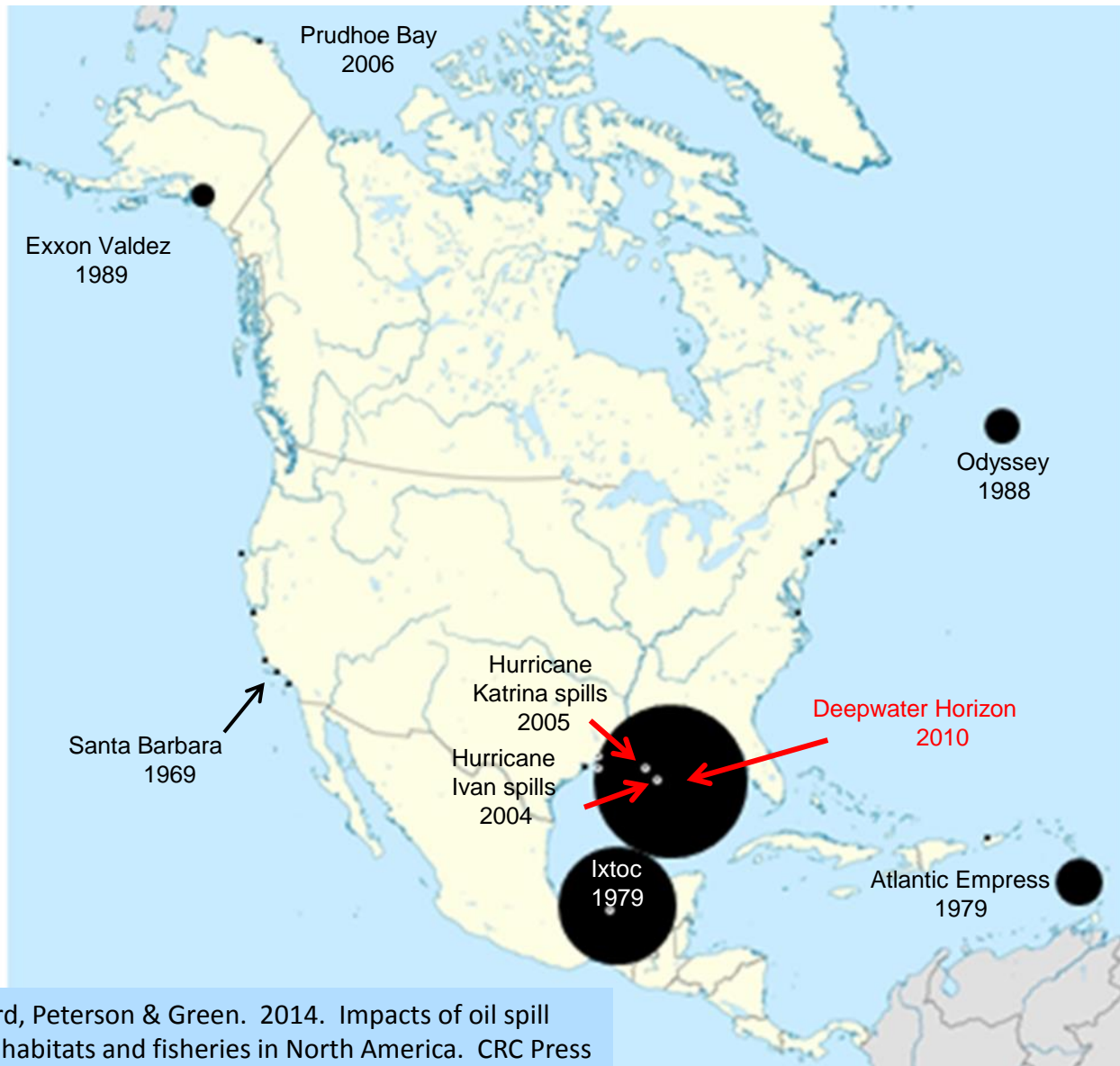
Marine Mammal Publications



Sea Turtle Publications



North American oil spills impacting marine environments



Redrawn from: Alford, Peterson & Green. 2014. Impacts of oil spill disasters on marine habitats and fisheries in North America. CRC Press

Accomplishments - Marine Mammals

- Deep Water Horizon Response & NRDA Injury Assessments (2010 – present)
- Science coordination of the longest and largest unusual mortality event in the northern GOMx (2010 – present)
- Studies for the Atlantic Marine Assessment Program for Protected Species Studies (AMAPPS - **BOEM**) 2010-2014
- Potential new subspecies of spotted dolphin (2014) and a genetically unique Bryde's whale population in the GOMx (2014)
- First shrimp otter trawl bycatch estimation for GOMx federal waters (2015)
- Developed method to prioritize research on bottlenose dolphin stocks based on threats and data availability (2014)



NOAA Technical Memorandum NMFS-SEFSC-665

A Method for Prioritizing Research on Common Bottlenose Dolphin Stocks Through Evaluating Threats and Data Availability: Development and Application to Bay, Sound and Estuary Stocks in Texas

BY
NICOLE M. PHILLIPS AND PATRICIA E. ROSEL



NOAA Technical Memorandum NMFS-SEFSC

ESTIMATION OF MARINE MAMMAL BYCATCH MORTALITY IN THE GULF OF MEXICO SHRIMP OTTER TRAWL FISHERY

BY
MELISSA S. SOLDEVILLA, LANCE P. GARRISON,
ELIZABETH SCOTT-DENTON, AND JAMES M. NANCE



Accomplishments – Sea Turtles

- First adult mortality estimates for adult loggerhead sea turtles (2011)
- Satellite tracking of juvenile and sub-adult loggerhead and green sea turtles in GOMx (2013, 2014)
- PR -SAIP Toolbox, phase one modeling with NEFSC
 - Spatial loggerhead simulation model: the utility of measuring mortalities as adult equivalents
 - Combined demographics and oceanic transport models to predict abundance and population structure in space and time
- Hind cast modeling of stranded sea turtles to determine points of origin based on surface current patterns
- NRC Postdoc training opportunities
 - Satellite tracking of neonate loggerhead sea turtles (K. Mansfield) 2014, 2015
 - Modeling sea turtle movements based on swimming behavior and ocean currents (N. Putman) 2013, 2014, 2015

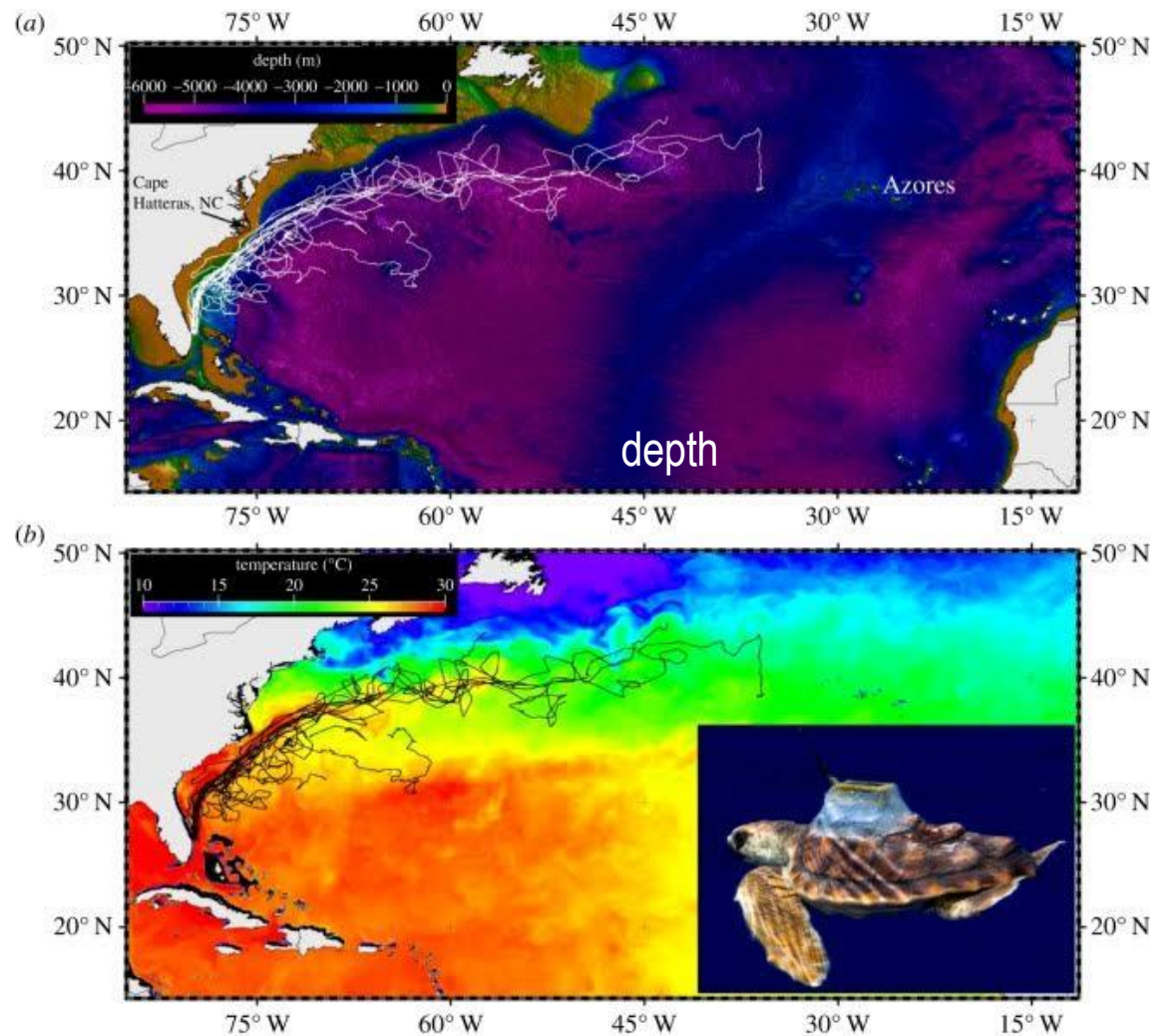
Accomplishments

Training and Research Opportunities

NRC Postdoc research

Kate Mansfield, Ph.D.

First satellite tracks of neonate sea turtles redefine the “lost years” oceanic niche
(Mansfield et al. 2014 . Proc. R. Soc.)

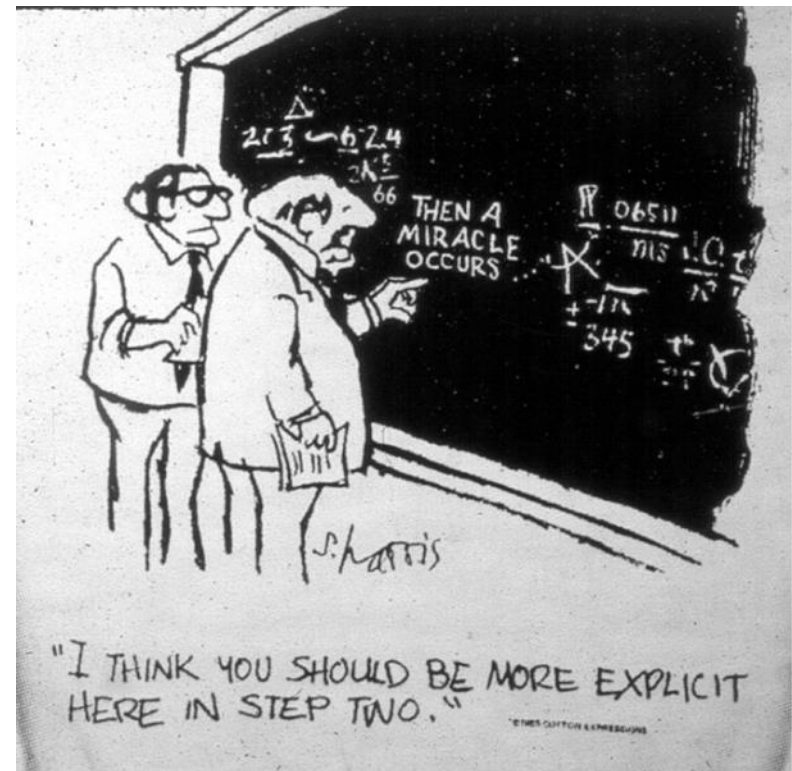


Challenges

- **Prioritization**
- **Partner communications**
- **Balance demands with capacity**
- **Short-term vs long-term allocation**
- **Protected species surveys**

(SEFSC gets 60 days dedicated ship time and has aircraft access, but must obtain outside operational funding)

- **Applying science to GOMx restoration**
- **Increased administrative burden**



Increased Admin requirements for PI's reduce research

Competing demands on NMFS scientists are often at the expense of investments in professional development, research and publication, and can lead to job dissatisfaction and burn out.

2010 DWH event and Northern Gulf UME

- **FOIA requests**
- **NRDA conference calls**
- Time logs, travel and expense documentation
- Legal review of publications

New administrative requirements

- **More permits & longer processing**
- Travel ceilings, accounting requirements
- IACUC -Institutional Animal Care and Use Committee
- DQA- Data Quality Act documentation
- **PARR – Public Access to Research Results**
- NOAA publication summaries
- Biological Opinions



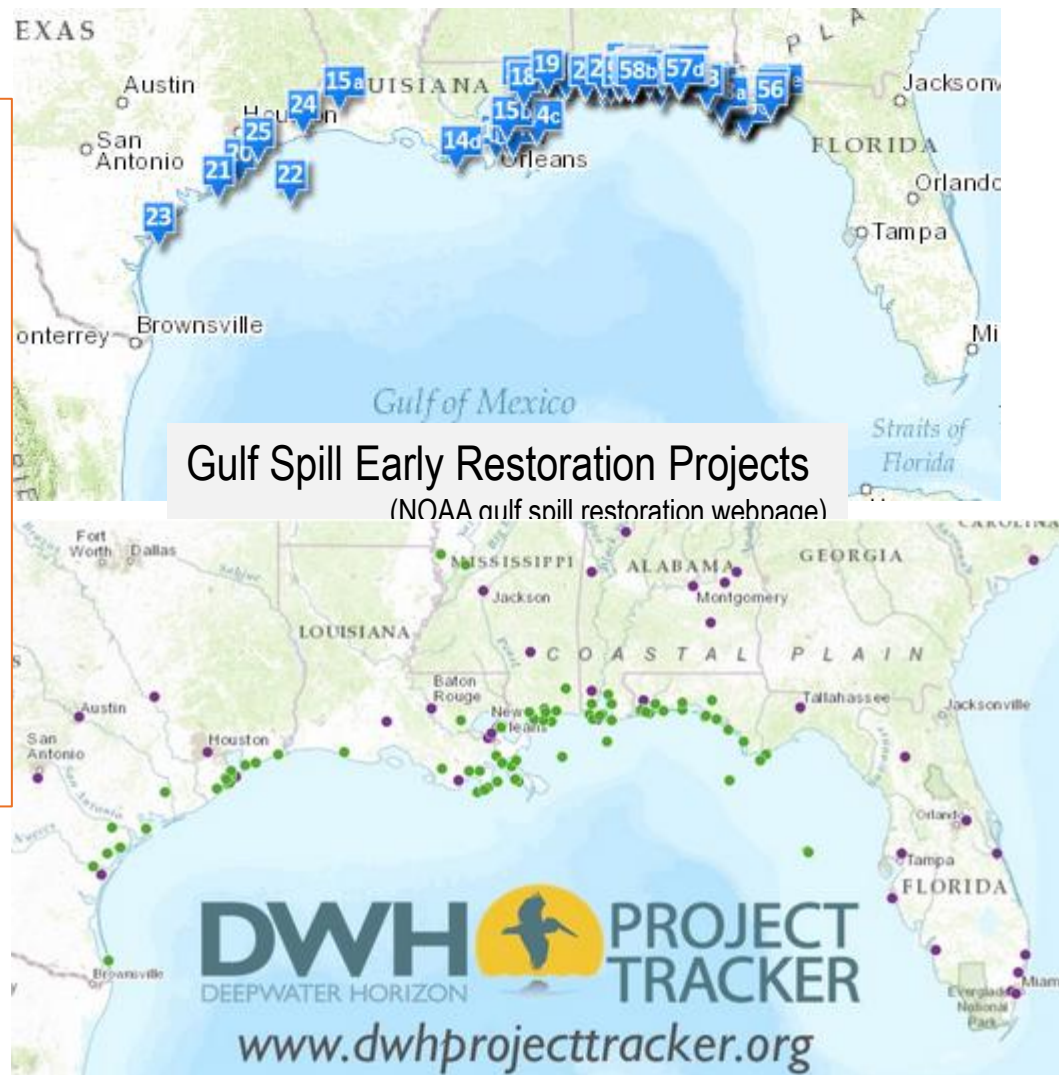
Reduced PI admin support

- To help with legal reviews and drafting of MOU, MOA, contracts;
- **Interagency fund transfers;**
- **Employee hiring** RADS, PFAR, WFM
- **Contractor hiring**
- Accountability requirements

GOMx Restoration Opportunities

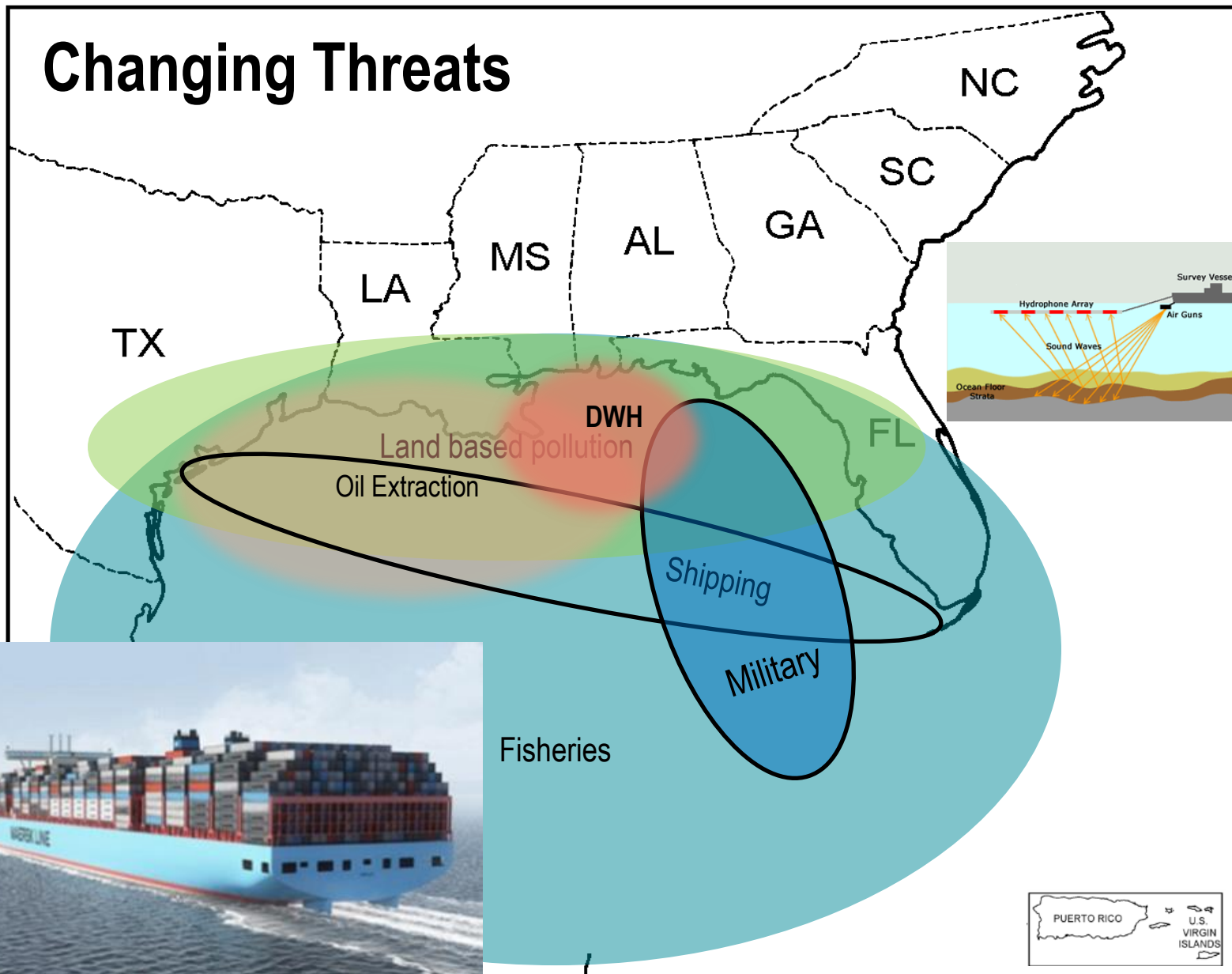
Restoration Science Issues and Needs:

- Monitoring of adaptive management
- Evaluate intervention effectiveness
- Develop and test predictive models
- Fill offshore coverage gaps involving protected species
- Incorporate ecosystem-based approaches for management



Gulf of Mexico Alliance website (August 7, 2015)

Changing Threats



Opportunities

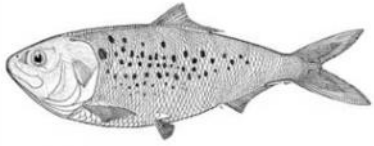
Threat	Fisheries
Direct mortality	Gear interactions
Serious injury	Gear interactions
Sublethal injury	Gear interactions
Habitat damage & loss	Gear interactions
Food-base depletion	Fishery competition
Food-base alteration	Fishery extraction



Other Threats to Protected Species

Threats	Oil & gas exploration & extraction	Oil & chemical spills	Military operations	Shipping	Land-based pollution	Coastal construction / dredging
Impacts						
Noise	Ship Engines,	X	X	X		X
	Ship Engines, Drilling Ops		Sonar			Dredging
	Seismic Surveys	X	Explosives			Explosives
			Sonic booms			
Ship / vessel strikes	X	X	X	X		X
Debris	X	X	X	X		X
Chemical / toxin exposure	X	X	X	X	X	X
Disease	X	X	X		X	
Hypoxia/dead zones	X	X			X	
Harmful algal blooms					X	X
Fish kills	X	X	X		X	X
Habitat alteration	X	X			X	X
Direct mortality	●	●	●	●	●	●
Serious injury	●	●	●	●	●	●
Sublethal injury	●	●	●	●	●	●
Habitat damage & loss	●	●	●	●	●	●
Food-base depletion	●	●	●	●	●	●
Food-base alteration	●	●	●	●	●	●

Fishery Impacts on Protected Species

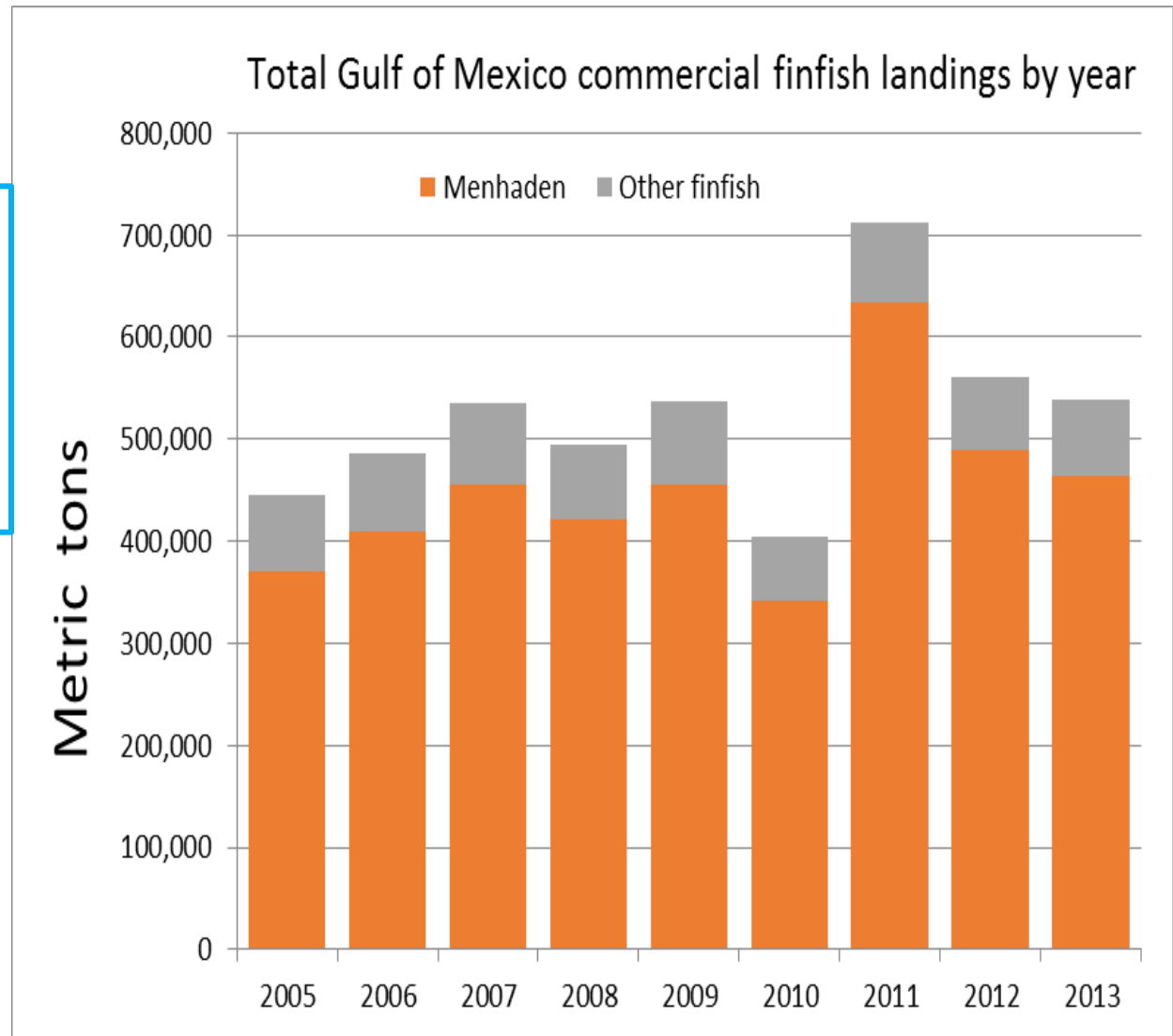


Food web alterations
and depletion

Forage competition with
fisheries

Menhaden are 83 - 90% of all
GOMx commercial finfish
landings.

Estimated bycatch (not shown)
is 31 million lbs.



Future Goals and Opportunities



Photo credit: National Hydropower Association 2015

Provide the science (monitoring, analysis, synthesis, modeling, and prediction) for adaptive ecosystem-based approaches for protected species management.

Next Steps?